

# FIRST HOP REDUNDANCY

## Protocols

### Hot Standby Router Protocol (HSRP)

Provides default gateway redundancy using one active and one standby router; standardized but licensed by Cisco Systems

### Virtual Router Redundancy Protocol (VRRP)

An open-standard alternative to Cisco's HSRP, providing the same functionality

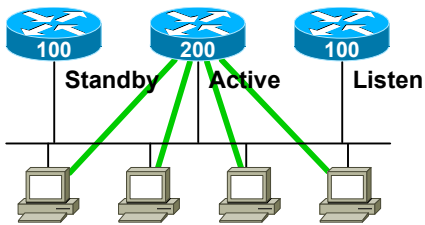
### Gateway Load Balancing Protocol (GLBP)

Supports arbitrary load balancing in addition to redundancy across gateways; Cisco proprietary

## Attributes

	HSRP	VRRP	GLBP
<b>Standard</b>	RFC 2281	RFC 3768	Cisco
<b>Load Balancing</b>	No	No	Yes
<b>IPv6 Support</b>	Yes	No	Yes
<b>Transport</b>	UDP/1985	IP/112	UDP/3222
<b>Default Priority</b>	100	100	100
<b>Default Hello</b>	3 sec	1 sec	3 sec
<b>Multicast Group</b>	224.0.0.2	224.0.0.18	224.0.0.102

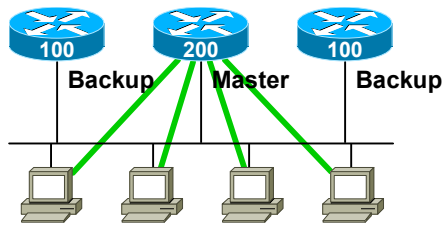
## HSRP



## HSRP Configuration

```
interface FastEthernet0/0
ip address 10.0.1.2 255.255.255.0
standby version {1 | 2}
standby 1 ip 10.0.1.1
standby 1 timers <hello> <dead>
standby 1 priority <priority>
standby 1 preempt
standby 1 authentication md5 key-string <password>
standby 1 track <interface> <value>
standby 1 track <object> decrement <value>
```

## VRRP



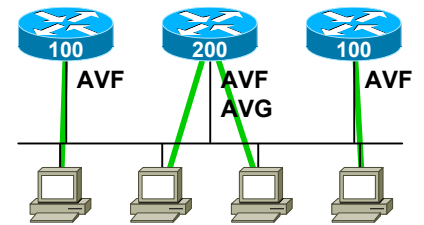
## VRRP Configuration

```
interface FastEthernet0/0
ip address 10.0.1.2 255.255.255.0
vrrp 1 ip 10.0.1.1
vrrp 1 timers {advertise <hello> | learn}
vrrp 1 priority <priority>
vrrp 1 preempt
vrrp 1 authentication md5 key-string <password>
vrrp 1 track <object> decrement <value>
```

## GLBP Configuration

```
interface FastEthernet0/0
ip address 10.0.1.2 255.255.255.0
glbp 1 ip 10.0.1.1
glbp 1 timers <hello> <dead>
glbp 1 timers redirect <redirect> <time-out>
glbp 1 priority <priority>
glbp 1 preempt
glbp 1 forwarder preempt
glbp 1 authentication md5 key-string <password>
glbp 1 load-balancing <method>
glbp 1 weighting <weight> lower <lower> upper <upper>
glbp 1 weighting track <object> decrement <value>
```

## GLBP



## HSRP/GLBP Interface States

**Speak** · Gateway election in progress

**Active** · Active router/VG

**Standby** · Backup router/VG

**Listen** · Not the active router/VG

## VRRP Interface States

**Master** · Acting as the virtual router

**Backup** · All non-master routers

## GLBP Roles

### Active Virtual Gateway (AVG)

Answers for the virtual router and assigns virtual MAC addresses to group members

### Active Virtual Forwarder (AVF)

All routers which forward traffic for the group

## GLBP Load Balancing

### Round-Robin (default)

The AVG answers host ARP requests for the virtual router with the next router in the cycle

### Host-Dependent

Round-robin cycling is used while a consistent AVF is maintained for each host

### Weighted

Determines the proportionate share of hosts handled by each AVF

## Troubleshooting

```
show standby [brief]  show vrrp [brief]
show glbp [brief]     show track [brief]
```